

### Diesel Generator Set

# **mtu** 12V4000 DS1650

380V – 11 kV/50 Hz/prime power for stationary emergency/ fuel consumption optimized/12V4000G14F/water charge air cooling





Optional equipment and finishing shown. Standard may vary.

### Product highlights

#### **Benefits**

- Approved for renewable fuels (e.g. HVO)
- Low fuel consumption
- Optimized system integration ability
- High reliability
- High availability of power
- Long maintenance intervals

#### Support

- Global product support offered

### Standards

- Engine-generator set is designed and manufactured in facilities certified to standards ISO 2008:9001 and ISO 2004:14001
- Generator set complies to ISO 8528
- Generator meets EC 60034-1, ISO 8528-3; IEC 60044-1;
   Declaration of conformity; EN55011, group 1, cl. B
- NFPA 110\*

### Power rating

- System ratings: 1590 kVA 1600 kVA
- Accepts rated load in one step per NFPA 110\*
- Generator set complies to G3 according to ISO 8528-5
- Generator set exceeds load steps according to ISO 8528-5\*

### Performance assurance certification (PAC)

- Engine-generator set tested to ISO 8528-5 for transient response
- 85% load factor
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

### Complete range of accessories available

- Control panel
- Power panel
- Circuit breaker/power distribution
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Mechanical and electrical driven radiators
- Medium and oversized voltage alternators

#### Emissions

Fuel consumption optimized

### Certifications

- CE certification option
- Unit certificate acc. to VDE-AR-N 4110



Renew able



## Application data 1)

Engine		Liquid capacity (lubrication)	
Manufacturer	mtu	Total oil system capacity: l	260
Model	12V4000G14F	Engine jacket water capacity: I	160
Туре	4-cycle	Intercooler coolant capacity: I	40
Arrangement	12V		
Displacement: l	57.2	Combustion air requirements	
Bore: mm	170	Combustion air volume: m³/s	1.6
Stroke: mm	210	Max. air intake restriction: mbar	50
Compression ratio	16.4		
Rated speed: rpm	1500	Cooling/radiator system	
Engine governor	ECU 9	Coolant flow rate (HT circuit): m³/hr	56
Max power: kWm	1420	Coolant flow rate (LT circuit): m³/hr	30
Air cleaner	dry	Heat rejection to coolant: kW	540
		Heat radiated to charge air cooling: kW	200
Fuel system		Heat radiated to ambient: kW	75
Fuel specification	EN 590, Grade No.1-D/2-D (ASTM D975-00),	Fan power for electr. radiator (40°C): kW	38
	EN 15940 (e.g. HVO)		
Maximum fuel lift: m	5	Exhaust system	
Total fuel flow: I/min	16	Exhaust gas temp. (after turbocharger): °C	430
		Exhaust gas volume: m³/s	4.0
Fuel consumption 2)	l/hr g/kwh	Maximum allowable back pressure: mbar	85
At 100% of power rating:	323.3 189	Minimum allowable back pressure: mbar	30
At 75% of power rating:	250.2 195		
At 50% of power rating:	173.7 203		

### Standard and optional features

### System ratings (kW/kVA)

Generator model	Voltage	fuel consumption optimized					
		without radiator			with mechanical	radiator	
		kWel	kVA*	AMPS	kWel	kVA*	AMPS
Leroy Somer LSA52.3 S5 (Low voltage Leroy Somer standard)	380 V	1280	1600	2431	1240	1550	2355
	400 V	1280	1600	2309	1240	1550	2237
	415 V	1280	1600	2226	1240	1550	2156
Leroy Somer LSA53.2 VL6 (Medium volt. Leroy Somer)	11 kV	1272	1590	83	1240	1550	81

<sup>\*</sup> cos phi = 0.8

All data refers only to the engine and is based on ISO standard conditions (25°C and 100m above sea level).

<sup>2</sup> Values referenced are in accordance with ISO 3046-1. Conversion calculated with fuel density of 0.83 g/ml. All fuel consumption values refer to rated engine power.

### Standard and optional features

### Engine

■ 4-cycle ■ Closed crankcase ventilation ■ Fuel consumption optimized engine Standard single stage air filter ■ Governor-electronic isochronous Oil drain extension & shut-off valve ■ Common rail fuel injection Generator ■ 4 pole three-phase synchronous ■ Insulation class H, utilization acc. to H ■ Meets NEMA MG-1, BS 5000, IEC 60034-1, Radio suppression EN 55011, group 1, cl. B VDE 0530. DIN EN 12601. AS 1359 and generator Brushless, self-excited, self-regulating, ■ Short circuit capability 3xln for 10sec ISO 8528-3 requirements self-ventilated ■ Winding and bearing RTDs Leroy Somer low voltage generator ■ Digital voltage regulator (without monitoring) ☐ Oversized generator ■ Excitation by AREP Anti condensation heater ☐ Medium voltage generator ■ Stator winding Y-connected, accessible ■ Mounting of CT's: 2 core CT's neutral (brought out) ■ Winding pitch: 2/3 winding ■ Protection IP23 ■ Voltage setpoint adjustment ± 10% Oil system ☐ Automatic oil refilling system ☐ Extended test run kit (including pre-lubrication pump) Cooling system Jacket water pump ☐ Mechanical radiator  $\hfill \square$  Jacket water heater with plate heat ■ Thermostat(s) ☐ Electrical driven front-end cooler exchanger Water charge air cooling ☐ Jacket water heater ☐ Pulley for fan drive Control panel Unit cabling with coded plugs for  $\square$  Mains parallel operation of Event recording easy connection of customer-specific a single genset (V6) ☐ IP 54 front panel rating with controls (VO)  $\square$  Mains parallel operation of integrated gasket  $\ \square$  Pre-wired control cabinet for easy multiple gensets (V7) ☐ Different expansion modules ☐ Basler controller ☐ Remote annunciator application of customized controller (V1+) ☐ Island operation (V2) ☐ Deif controller ☐ Daytank control ☐ Automatic mains failure operation with ☐ Complete system metering ☐ Generator winding temperature ATS (V3a) Digital metering monitoring ☐ Automatic mains failure operation Engine parameters ☐ Generator bearing temperature incl. control of generator and mains Generator protection functions monitorina breaker (V3b) ■ Engine protection ☐ Modbus TCP-IP

■ SAE J1939 engine ECU communications

■ Multiple programmable contact inputs

Parametrization software

Multiple contact outputs

Multilingual capability

Represents standard features

☐ Island parallel operation of multiple

short (< 10s) mains parallel

overlap synchronization (V5)

 $\hfill \square$  Automatic mains failure operation with

gensets (V4)

Represents optional features

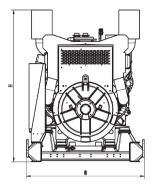
### Standard and optional features

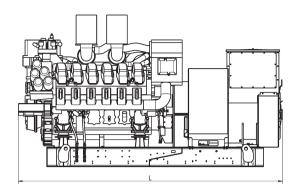
### Connectivity

transfers engine data to the manufacturer from time to time. The data is used by the	development and improvement as well as service optimization.	https://mtu-go.com and also gain insight int the data.	
Power panel			
□ Supply electrical driven radiator from 45kW – 75kW			
Circuit breaker/power distribution			
☐ 3-pole circuit breaker ☐ 4-pole circuit breaker	☐ Electrical-actuated circuit breaker	☐ Base frame mounted GCB, pre-wired with generator, ready for commissioning	
Fuel system			
<ul> <li>Flexible fuel connectors mounted to base frame</li> <li>Fuel filter with water separator</li> <li>Fuel filter with water separator heavy-duty</li> </ul>	<ul> <li>Switchable fuel filter with water separator</li> <li>Switchable fuel filter with water separator heavy-duty</li> <li>Seperate fuel cooler</li> </ul>	☐ Fuel cooler integrated into cooling equipment	
Starting/charging system			
<ul><li>24V starter</li><li>Redundant starting system</li></ul>	☐ Starter batteries, cables, rack, disconnect switch (lockable)	☐ Battery charger ☐ Alternator	
Mounting system			
<ul><li>Welded base frame</li><li>Resilient engine and generator mounting</li></ul>	<ul> <li>Modular base frame design</li> <li>Base frame mounting on foundation/base plate with using clamping brackets</li> </ul>	□ Spring mounts with 95% degree of isolation	
Exhaust system			
<ul><li>Exhaust bellows with connection flange</li><li>Exhaust silencer with</li><li>10 dB(A) sound attenuation</li></ul>	☐ Exhaust silencer with 30 dB(A) sound attenuation	<ul><li>□ Exhaust silencer with</li><li>40 dB(A) sound attenuation</li><li>□ Y-connection-pipe</li></ul>	

- Represents standard features
- ☐ Represents optional features

### Weights and dimensions





Drawing above for illustration purposes only, based on a standard open power 400 Volt engine-generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry/less tank)		
Open power unit (OPU)	4059 x 1810 x 2330 mm	10654 kg		

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific engine-generator set.

### Sound data

- Consult your local *mtu* distributor for sound data.

### **Emissions** data

- Consult your local *mtu* distributor for emissions data.

### Rating definitions and conditions

- Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514 and AS 2789. Average load factor: ≤ 85%. Operating hours/year: max. 500.
- Consult your local *mtu* distributor for derating information.